

CLAIMS:

1. A heat-transfer pipe with internal grooves,
wherein

a plurality of rows of grooves arranged in V-
shaped patterns (3) symmetric with respect to a pipe axis
direction are provided on an inner surface (2) of a pipe
body (1a); and

widths of the plurality of rows of the grooves
(3) arranged in the V-shaped patterns are made unequal in a
circumferential direction.

2. The heat-transfer pipe with internal grooves
according to claim 1, wherein

secondary grooves (6) having a prescribed depth
are formed from a top (5a) side towards a base (5b) side at
least in part of projected portions (5) formed between
respective grooves (3) of the plurality of rows of the
grooves (3) arranged in the V-shaped patterns.

3. The heat-transfer pipe with internal grooves
according to claim 2, wherein

the secondary grooves (6) are notched grooves in
a spiral direction.

4. The heat-transfer pipe with internal grooves
according to claim 1, wherein

secondary grooves (7) having a prescribed depth
are formed in an outer surface of at least part of projected

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portions (5) formed between respective grooves (3) of the rows of grooves (3) arranged in the V-shaped patterns.

5. The heat-transfer pipe with internal grooves according to claim 4, wherein

5 the secondary grooves (7) are fine grooves extending from one side surface of the projected portions (5) to the other side surface thereof.

6. A method for manufacturing a heat-transfer pipe with internal grooves, wherein

10 a first marking roll (11) for marking a plurality of rows of grooves (3) arranged in V-shaped patterns in a flat plate-like heat-transfer pipe material (13), a second marking roll (12) for marking secondary grooves (7) at least in part of projected portions (5)

15 formed between respective grooves (3) of the plurality of rows of the grooves (3) arranged in the V-shaped patterns and a roll forming device (17) for forming the flat plate-like heat-transfer pipe material (13) into a cylindrical pipe are used to continuously mark the plurality of rows of

20 the grooves (3) arranged in the V-shaped patterns and the secondary grooves (7) in the flat plate-like heat-transfer pipe material (13) successively by the first and second marking rolls (11), (12) and then form a cylindrical pipe by roll forming by the roll forming device (17).

25 7. A device for manufacturing a heat-transfer pipe

with internal grooves, wherein

a first marking roll (11) for marking a plurality of rows of grooves (3) arranged in V-shaped patterns in a flat plate-like heat-transfer pipe material (13), a second marking roll (12) for marking secondary grooves (7) at least in part of projected portions (5) formed between respective grooves (3) of the plurality of rows of the grooves (3) arranged in V-shaped patterns and a roll forming device (17) for forming the flat plate-like heat-transfer pipe material (13) into a cylindrical pipe are provided successively side by side in a direction of movement of the flat plate-like heat-transfer pipe material (13) to continuously mark the grooves (3) arranged in the V-shaped patterns and the secondary grooves (7) successively by the first and second marking rolls (11), (12) and then form a cylindrical pipe by roll forming by the roll forming device (17).

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